National Aeronautics and Space Administration

Educational Program	
Educators & Students	Grades K–12

EP-2002-08-387-HQ

2002–2003 Theme: Centennial of Flight

NASA

Student Involvement Program

Science & Technology Journalism

NASA's mission is

- To understand and protect our home planet,
- To explore the Universe and search for life,
- To inspire the next generation of explorers *as only NASA can.*

Resource Guide

2002–2003 National Competitions

National Aeronautics and
Space Administration

NASA's vision for the future is:

- To improve life here,
- To extend life to there,
- To find life beyond.

NASA's mission is:

- To understand and protect our home planet,
- To explore the Universe and search for life,
- To inspire the next generation of explorers as only NASA can.

You may obtain the official Entry Packet for the 2002–2003 competitions by downloading it from the NSIP web site, ***http://education.nasa.gov/nsip***, or you may contact us by e-mail (***info@nsip.net***) or by telephone at 1-800-848-8429.

This Resource Guide provides background information and learning activities for you to help your students participate in the NASA Student Involvement Program (NSIP) competition **Science & Technology Journalism.**

Use this Resource Guide together with the official NSIP Program Announcement poster and the entry packet (see previous page for more details).

The guide is designed for teachers of students in grades K–12. This is a wide age range, so feel free to adapt the materials and activities to make them easier or more challenging.

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Competition Categories

Grades K-1	Whole Class
Grades 2–4	Teams or Whole Class
Grades 5–8	Individual or Teams of 2–4 Students
Grades 9–12	Individual or Teams of 2–4 Students

The 100th Anniversary of Flight Is Big News!

2003 is the 100th anniversary of an event that changed the way we live, work, and travel. The world's first controlled, powered flight represented breakthroughs in science and technology and made the world a little smaller. The invention of the airplane was a fundamental turning point in history. It redefined the way we fought our wars, revolutionized travel and commerce, and fueled the process of technological change. Flight will continue to be one of humankind's most significant accomplishments.

What happens behind the scenes as reporters cover stories about flight? What knowledge of science do the reporters need? How do they decide what to focus on in their report? How do they translate complex topics into simpler terms for a wide audience? How do they decide what to focus on in their report? How do they find the human stories underlying the technological achievement? How do they check for accuracy? And how do they connect readers, listeners, or viewers to the "big ideas" behind the big event?

Students will be reporting to an audience of their peers. Concepts should be appropriate for this audience. If the reporters are kindergarteners, the product should be for this audience and represent the students' effort at this age. If the reporters are ninth graders, the product should be reflective of ninth graders.

What Students Will Learn

In this NSIP competition, students experience the challenge of reporting on the history of flight and its future. In preparing a news report, students conduct research, learn core science and engineering concepts, find the human element, select graphics, and prepare the news story for an audience of their peers. In so doing, students learn science, develop research skills and learn how to communicate effectively. They become a more observant, sensitive and savvy audience for science and technology news. In accordance with the National Science Education Standards, students will:

- Learn core concepts of flight.
- Develop skills of scientific inquiry.
- Experience the unifying concepts and processes of science.
- Appreciate the multi-faceted roles of science and technology in our society.
- Analyze and report on the history of science and technology.
- Gain new skills with technology (computers, Internet, satellite images and other data, and audio-visual production).
- Work collaboratively as team members.
- Develop communication skills, including investigative research, interviewing, organizing, analyzing, summarizing, writing, and speaking.

Preparing a Science News Report

This seven-stage process may help you to select, research, write, and produce a news report. However, creativity is encouraged, so feel free to use whatever approach works for you.

I. What's News?

First find out what aviation events, aeronautics initiatives, or related topics are currently in the news or will be within the next year. Pay attention to the news on the TV, radio, newspapers or magazines, or log on to ***ttp://www.centennialofflight.gov***. The site contains information about events scheduled at airports and other locations across the United States. You also can subscribe (for free) to NASA's e-mail news notification system or contact the Public Affairs Office (PAO) of a NASA Field Center to get information on Century of Flight and other news (see "Resources" on page 17).

II. How to Select a Relevant and Interesting Topic

As students focus on news about the history of flight, they will find some topics are especially interesting. You might also select topics that are closely related to your curriculum. Students should narrow the selection down to a few topics and then choose one based on criteria such as an engaging story, an important "big idea," a local connection, or convenient access to good sources of information.

III. How Do You Conduct the Research?

Next, students gather as much useful information as possible on this topic. Sources will depend on the topic, but might include official web sites for the centennial of flight (there are several), or official press releases from a NASA Public Affairs Office, or an interview of an expert from a local university, or a business involved in aviation or aeronautics. Students might also find published articles or reports. If you have access to NASA TV, you can watch live reports, education programs, or observe press conferences. Students may videotape brief segments from NASA TV to include in their video (see "Resources" on p. 17).

IV. Who Is Your Audience?

Your audience is a group of your peers, your classmates. This does not mean that you cannot share your report with the local community newspaper. On the contrary, it is important to share your findings with the local community. You will need to contact them to see if they want a feature article or an editorial. They can best direct you to the type of writing they prefer. Keep in mind that an audience of your peers may not have the previous knowledge to understand your project. You will need to include some background information.

V. How Do You Write a News Report?

Imagine the audience as a group of your peers who have an interest in, but no advanced knowledge or understanding of the history of flight. Next, brainstorm and list the key things you want to communicate, including both the event or story and the "big ideas" embodied in the story. Some team members will write the first draft, others review and edit it, and others acquire or prepare the graphics, such as photos, graphs, charts or illustrations. Finally, pull all the pieces together into the final draft for either print or video. Remember to recheck for accuracy and clarity.

VI. How Do You Publish or Broadcast the Report?

NSIP encourages students to publish or broadcast their news report. Not only is this a service to the audience, it also provides students with a real context to help improve their content and style. (Publishing or broadcasting also adds five bonus points in the judging!) For example, the article might be published in a school newsletter or a local newspaper. The video might be broadcast on a community access cable channel. Remember, a news report communicates to an audience. Students play the essential role in telling the story clearly, accurately, and engagingly.

VII. How Do You Prepare the Entry?

Whether or not the news report is actually broadcast or published, students can prepare their entry, as detailed in the NSIP guidelines for the competition. Print articles should be laid out as they would look in print, with text, titles, and graphics. Video reports need to be of high quality, with appropriate sound and visual elements. Each entry will be judged on the content of the report, the quality of the research, and the effectiveness of the communication. Be sure to include the required separate description of the research and development process and the resource list.

Background Information on Flight and Aviation History

What Makes a Story Newsworthy?

As you read the newspaper, watch TV, listen to the radio or surf NASA web sites, you will find one or more interesting stories related to the history or future of flight virtually every week. An experimental airplane is tested, a commercial airliner is updated, an automated plane makes important discoveries over other lands, a new kind of space explorer—NASA's new Educator Mission Specialist—brings an educator's perspective to space flight. Why are these events newsworthy?

Orville shows off the Model A Wright Flyer at Fort Myers, Virginia, in September 1908.

Human Drama

Aeronautics research and aviation are innovative and challenging. These fields call on humans to pilot new aircraft, design powerful fighter planes, build solid and protective commercial airliners, and test the limits of human endurance. These are stories about people with high aspirations and the inevitable mix of success and failure. We care about these heroic scientists, engineers, and aviators. Their struggles and achievements inspire and challenge us all.

The first flying machines were patterned after birds. The bird-like aircraft designs were attractive and intriguing but failures as flying machines. It was necessary to understand how gliding objects with different shapes cut through the air. A little experimentation demonstrates that some shapes are better at staying aloft than others. The advent of the wind tunnel freed experimenters from waiting on the weather for a good, steady wind. This allowed aeronauts to perform controlled experiments on a series of wing shapes and airfoils in the lab. But none were as tenacious and independent minded as the Wright brothers.

The Wrights studied the work of the pioneers of aviation and performed many experiments with gliders before moving on to adding a motor for power. The failure of their 1901 glider experiments at Kitty Hawk demonstrated to them that some of the accepted aeronautics knowledge of the time was flawed. This discovery did not exactly lift their spirits, as they noted:

> Having set out with absolute faith in the scientific data, we were driven to doubt one thing after another, til finally after two years of experimentation, we cast it all aside, and decided to rely entirely upon our own investigations.
>
> — from *Wind Tunnels of NASA*; see the Resources section of this guide, p.17, or ***http://www.hq.nasa.gov/office/pao/History/SP-440/contents.htm***

They returned home to Dayton, and within three months, they had collected enough basic data from their extensive wind tunnel experiments to build the successful 1902 glider and to move on to the motorized 1903 aircraft that made the world's first controlled, powered flight.

New Discoveries

> There is something quintessentially American about Orville and Wilbur Wright's historic achievement at Kitty Hawk on December 17, 1903. They worked independently, as most American heroes have done, free of the entanglements of large industrial or government organizations. Their intense preoccupation with their airplane was fueled not by economic necessity—income they already had, from their bicycle business—but mostly from their imaginative determination to cross one of the last technological barriers to human flight—stability in the air.
>
> — from the "Consider a Career in Aerospace" poster; see the Resources section of this guide, p.17

Before the Wright Brothers, many tried to fly. Who were they? What benefits did their efforts bring to our world? What inventions are happening right now? What is

The Altus II Uninhabited Aerial Vehicle in flight. Based at the Key West Naval Air Station in Florida, researchers in the Altus Cumulus Electrification Study (ACES) will chase down thunderstorms using an uninhabited aerial vehicle, or "UAV" — allowing them to achieve dual goals of gathering weather data safely and testing new aircraft technology.

the future of aviation? Can you predict aviation's future milestones?

There are many excellent resources on the history of flight. For example, NASA's history web site contains many documents covering a range of topics from "Aeronautics" to "X-planes," with many items of interest in between, including aeronautics history, Apollo, the International Space Station, Sputnik, timelines, and women's contributions in air and space. (See the Resources section of this guide, p. 17.)

Inventing the Future

The future doesn't just happen. Our behavior, decisions, inventions, and actions shape the future. This is especially true in the case of flight. Engineers and scientists are dreaming, designing, and experimenting. They are inventing the future—new high-speed civilian aircraft. Many of these inventions will become reality in the years and decades ahead, and will define the future in which today's students will live, enabling them to travel around the world at previously unheard of speeds and to journey into Earth orbit and beyond.

Technological Achievements— Protecting Our Home Planet

The Age of Flight has provided us with a new perspective of Earth, transforming our understanding of our home planet. All of these resources enable us to explore Earth in ways never before possible. They help us understand the interactions between the human presence and the physical environment, and help us manage our resources and our environment to improve life on Earth.

The following excerpt, from a NASA press release, demonstrates that aerospace technology is newsworthy not just because of the new technology angle, but because of its potential human benefits. Aeronautics research programs are rich with such stories.

> ***NASA to Study Lightning Storms Using High-Flying Uninhabited Vehicle.*** To better understand both the causes of an electrical storm's fury and its effects on our home planet, NASA and university research scientists will use a tool no atmospheric scientist has ever used to study lightning—an uninhabited aerial vehicle. This will be the first time a UAV is used to conduct lightning research. "What we learn has the potential to help forecasters improve weather prediction, especially for storms that may produce severe weather," says Dr. Richard Blakeslee, a NASA atmospheric scientist at the Global Hydrology and Climate Center in Huntsville. "Also, by learning more about these individual storms, we hope to better understand weather on a global scale."
>
> By learning more about individual storms, scientists hope to better understand the global water and energy cycle as well as climate variability. The study also will provide federal, state, and local governments with new disaster-management information for use during severe storms, floods, and wildfires. In the process, researchers will learn more about UAV aircraft and how they can be used for future research missions.
>
> The Altus overcomes the limitations of conventional aircraft that, because of their greater speed, provide only brief snapshots of storm activity sandwiched between long periods of no observations. As part of NASA's Uninhabited Aerial Vehicle-based science demonstration program, these flights also will demonstrate this aircraft's ability to carry Earth-viewing scientific payloads into environments where pilots would be exposed to potentially life-threatening hazards. The mission is part of NASA's Earth Science enterprise, a long-term research effort designed to help us better understand and protect our home planet, while inspiring the next generation of explorers.

To read the full story and view photos, visit ***http://www.msfc.nasa.gov/newsroom/NSSTC/news/photos/2002/photosN02-007.html***

Three Keys to Effective Journalism

STORY ELEMENTS CHECKLIST

AUDIENCE?

- ❑ *Does the entry address an audience of your peers?*

WHO?

- ❑ *Is there a clear subject/protagonist for the piece?*
- ❑ *Did the student contact and interview an expert researcher or scientist for the piece?*
- ❑ *Is a real life example used to illustrate and develop the theme?*
- ❑ *Does the piece feature action and explanation by an expert?*
- ❑ *Are quotes used appropriately to explain and inform?*
- ❑ *Does the reporter make the interview subject interesting?*
- ❑ *Does it portray scientists and/or engineers authentically?*

WHAT?

- ❑ *Is the story line concrete, factual and descriptive information included to make the story real?*

WHEN/WHERE?

- ❑ *Does the reporter set the scene and make the audience feel like they are really there?*
- ❑ *Is the story tied to current events, the time of year, or hot topics in the news?*
- ❑ *Are important places named and key dates noted?*

WHY/HOW?

- ❑ *Does the piece educate as well as inform and entertain?*

1. Event ▸ Reporter ▸ Audience

Think about how you learn about events around you. We rarely experience a news event directly. Usually a reporter selects the most important elements of the event, prepares a news report, and communicates it to us via print, audio, or video. The reporter has an essential role as the intermediary between the event and the audience. He or she (or the reporting team) must exercise good judgment to select the most important elements. Good communication skills are essential for conveying this information clearly, accurately, and engagingly. A good reporter has the ability to understand information and translate it into simpler explanations. Students will be judged on their ability to communicate clearly, accurately and responsibly to the intended audiences.

2. Who, What, When, Where, Why, and How?

Your students are probably familiar with the classic "w" words of reporting. While they may seem elementary and obvious, they are all essential elements of a news story. Some news reports answer these questions at the very beginning; others weave the answers more subtly into the body of the report; some use graphics to convey these points; still others summarize this information in pithy statements at the end of the report. Regardless of technique, your students will be judged on how effectively they answer these six key questions.

3. Link Events with Big Ideas

The best news reports go beyond the basic facts of the event to present the big ideas. For example, the Pegasus Hypersonic Experiment aircraft isn't just a test of new aircraft design and propulsion technologies; it's about inventing the high-speed civilian transportation of the future. NASA's Uninhabited Aerial Vehicle demonstrates the ability to carry Earth-monitoring equipment into hazardous environments, but more importantly it's about keeping pilots from being exposed to potentially life-threatening situations. Your students will be judged on how well they present the big ideas embodied in the events.

Suggestions for Production Design

Here are some suggestions on how to select and make effective use of print, audio, or video formats:

FORMAT

In deciding which format to use, consider the following:

Reflect on what each format requires.

Video presentations demand not only recording equipment, but editing equipment as well. You may want to use computers and still photography cameras for print production.

What's the nature of your story?

Some stories offer strong images; some feature great sounds; and some require the depth and detail offered by print journalism. Use the format that best communicates your story.

Consider the time limitations.

Will you have enough time to develop photographs, process images, or edit tapes?

Which format fits the skills of your team?

Do you have good writers, photographers, or graphic artists in your team? Are there team members experienced in audio or video production?

PRINT

Think about the newspaper or magazine articles you have read. What components did they have in common? How did they appear on the page? What caught your eye?

A Bold Headline

The lead headline should be in large, bold lettering. It should capture the essence of the story in a way that encourages readers to read it.

Sub-Head

Sometimes a story has a sub-head under the lead headline. It is in smaller lettering and can be italicized. It provides additional information about the significance of the story.

Body Text

This is the story presented in plain, easy-to-read lettering.

Graphics

These can be photographs, illustrations, drawings, tables, or charts that appear on a printed page. Either scan your graphics into a computer or lay out the original artwork on your pages.

Captions

Captions should identify graphics and cite their artists or photographers.

Page Design

If possible, lay out your story in two- or three-column pages. Many word processors have page design capabilities and your computers may have page layout applications. Plan where you want your illustrations and captions to appear.

Possible Job Responsibilities

Writer, reporter, editor, page designer, page layout artist, photographer, photography editor, or illustrator.

VIDEO

Think about how you respond to visual presentations. Do visuals sometimes help you understand the subject better? Do you get distracted sometimes, and find it difficult to focus on the essence of the presentation? What kind of information can be conveyed better through video rather than in print?

Your first goal is to inform an audience of your peers, not entertain.

Do not linger too long on any image, yet avoid the frenetic, fast-paced editing of an MTV video. When done, view your presentation without the sound and ask yourself if viewers can get a sense of your story from just watching the visuals.

Tell your story visually.

Avoid too many "talking heads," which are static shots of people speaking. Vary what you show and keep the pacing brisk. When people are speaking, show appropriate images to bolster what they are saying. Use images to convey a sense of location. For example, first show a full shot of a building, then take viewers inside.

Sound quality is an important consideration.

Make sure it is crisp and at an appropriate volume. Enhance your story with music. Make sure that you have permission to use any pre-recorded sound tracks.

Consider using a teammate as a "stand-up" reporter.

As in local news broadcasts, tape the reporter on location explaining the story. Frame the shot so that a visual component of the story, such as a building or a device, is in the background.

How about using recorded footage?

For minimal fees, you can obtain videos or slides from NASA CORE (see "Resources" on p. 17). Acquiring news footage from local television stations is usually expensive. If you choose to record live newscasts off the air, be sure you get permission from your local television station.

Editing can be a challenge.

It is relatively easy to shoot interviews and capture images with video. The real challenge is in the editing, which requires some expertise. It is possible to "shoot in the camera," i.e., you shoot your video in the exact sequence it will be presented on a single tape. In effect, you do all the editing in the camera. This requires much practice to do well. Remember, you can't edit out mistakes this way.

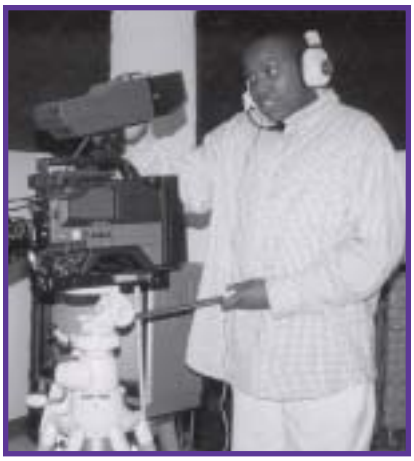
Do you have the equipment?

Before planning a video project, find out about your access to equipment. What equipment is available at your school's audio-visual department or from the community library? Do you have access to editing facilities at the local cable company? Many cable companies offer access to video production facilities to students and educators in their communities.

Possible job responsibilities

Camera person, reporter, writer, print editor, video editor, sound person, producer. The producer is not necessarily the boss; the producer arranges interviews, obtains any necessary permissions, and ensures that other team members are equipped to do their jobs.

Prepare Your Entry



ENTRY COMPONENTS

Your report should have the following components:

I. Develop a news report in one of the following media:

Print—Submit an article of 1500 words or less, plus relevant photos, illustrations or other graphics, laid out for publication.

VHS videotape—Submit a five-minute (maximum) report in your choice of format (e.g., newscast, investigative or special report, or documentary).

II. Separately, submit supportive documentation, with two sections:

A. Investigation and Production Methods—Describe the techniques used to gather information or opinions expressed, and the methods and equipment used in report production (maximum length 250 words).

B. Resource Credits—List all reference books, periodicals, web sites, imagery, and people (including names, work titles, and type of help provided) contributing to the research basis and validity of your news report.

To get a detailed description of how these components will be evaluated, examine the Judging Rubric on the following pages.

Science & Technology Journalism Judging Rubric

Grades K–1, 2–4, 5–8, 9–12

This rubric is designed for all grade levels. Teachers should adapt the rubric to match their students' ability levels.

Entries must meet the following minimum standards. Entries not in compliance will not be judged.

- Entries must demonstrate a connection to the history and concepts of flight.
- Print entries must be laid out for publication.
- Videotapes must function and be clearly audible.

A. STORY, RESEARCH & ANALYSIS 70 Points Maximum

LEVEL	1. STORY LINE *Is there a distinct, strong story line that relates events to "big ideas"?*	2. STORY STRUCTURE *Is there a clear structure and does it support the story line?*	3. BACKGROUND RESEARCH *Does the story use multiple sources to build an objective analysis that engages and educates?*	4. UNDERSTANDING *Does the report demonstrate a clear understanding of relevant facts and theories?*	5. DATA AND GRAPHICS *Does the report utilize relevant data, images, maps, and graphs to support the story line and the analysis?*
0	Sentences are not original. There is no story line.	Structure is not apparent.	None or few sources of background research was used to develop the story.	Understanding is confusing; basic concepts missing or incorrect	Little meaningful data are present. Few if any original and supporting graphics are present.
1	Sentences are original. Unclear that there is a main story line.	Unclear beginning, middle and end.	Few supportive sources were used to develop the story.	Understanding of some basic concepts is missing or incorrect.	Some meaningful data are present. May have some original and/or supporting graphics are present.
2	Sentences are original. Story line is present but not well developed.	Clear beginning, middle and end.	Several supportive sources were used to develop the story.	Understanding of basic concepts is mostly correct.	Mostly meaningful data are present. Some original and supporting graphics are present.
3	Story flows well, is original in idea or approach; language appropriate for the authors and the audience.	Clear beginning, middle and end with supporting details.	Many sources of background research were identified to develop the story.	Understanding of all basic concepts is correct.	All meaningful data are present. Many original and supporting graphics are present.
4	Story flows well, is especially creative, and engages the reader; language appropriate for author and audience.	Clear beginning, middle and end with supporting details and descriptions.	Varied and quality sources of background were identified to develop the story.	Understanding of all basic concepts is correct and is appropriate for the peer audience.	All meaningful data are creatively presented. All original and supporting graphics presented with details.
	Level _____ × 3.75 = _____ points	Level _____ × 3.75 = _____ points	Level _____ × 3.75 = _____ points	Level _____ × 3.75 = _____ points	Level _____ × 2.5 = _____ points

Subtotal points from this page _____

B. COMMUNICATION 30 Points Maximum

LEVEL	6. PRESENTATION *Is the story engaging, informative, and persuasive? Does it use the strengths of its format? Does it educate as well as entertain?*	7. RESOURCE CREDITS
0	Presentation is disorganized; evidence of last minute efforts, significant components are missing.	Not present.
1	Presentation is plain, but lacks clear organization, not engaging; poor presentation of data and graphs.	Minimal resources are cited.
2	Presentation is plain, somewhat clearly organized, somewhat engaging, but does not take advantage of the format.	Contains citations from few sources; citations are indirectly related to the report.
3	Presentation is neat, original, clearly organized, engaging; data and graphics are presented well, appropriate use of format; it educates OR entertains the audience.	Contains some relevant citations from multiple sources (i.e., not exclusively Internet); citations are directly related to the report.
4	Presentation is neat, original, clearly organized, engaging; data and graphics are presented well; persuasive presentation takes advantage of format; it educates AND entertains the audience.	Contains many relevant citations from multiple sources (i.e., not exclusively Internet); citations are directly related to the report.
	Level _____ × 3.75 = _____ points	Level _____ × 3.75 = _____ points

Subtotal points from this page _____

Total points _____

***5-Point Bonus**: Was the article or video presented to a real audience (i.e., a presentation in the school, community organization, or local media)? A copy of the printed article or a letter signed and dated by a responsible official confirming the video presentation has been provided documenting the fact the publication occurred before January 31, 2003.*

ADD 5 Points _____

Sample Learning Activities

Writing About Flight

The Wright Brothers Giant Step

Why did the Wright brothers' very brief (12-second) first flight make international news in 1903? How did that event influence the course of the last hundred years of flight? What giant steps may shape the future of flight?

I. Engaging Student Interest

Students are naturally curious about the world around them. As children, Orville and Wilbur Wright adored flight. They both flew kites, and had a balsa wood wind-up plane. The Wright Brothers were in their mid-twenties in 1896, when they became interested in making their own plane design. At that time, adventurers from many nations, backed by government and industry, were energetically trying to build flying machines. Many cities around the world will be celebrating the 100th Anniversary of Flight. Visit: ***www.centennialofflight.gov*** for current information about what events are happening in your city and state honoring the Wright brothers' accomplishment. To set the stage for science learning, begin by introducing the assignment with a pre-reading activity. This may be a journal entry beginning with, "I wonder ...." The students should have time to share their ideas.

A followup activity might be to have each student imagine they are going to design the plane of the future. What would it look like? How fast would it go? Where would you go in it? How would it be fueled? How would this new plane change the way we live? Would it require a new kind of airport? Would it change the way we transport things? Would it help save lives? Would it be less expensive than current aircraft, or more? Would it be safer for passengers? for the environment? What kind of problems would need to be overcome?

Before the Wright brothers flew a powered airplane in December 1903, they tested their aeronautical engineering with a series of unpowered gliders. Here they fly one off Kill Devil Hill in Kitty Hawk, North Carolina.

II. Background Research

Once students have settled on an area of interest it is time do some research. How do aircraft fly? Understanding something about the fundamentals of flight will help make sense of the history of different designs that have evolved over the last hundred years and what may evolve in the next hundred.

It is helpful to make the experience as interdisciplinary as possible. Aircraft design was influenced by many things, including physics, art, politics, economics, chemistry, and so on. Recently, computers have had a strong impact on the process of aircraft design. NASA's Glenn Research Center has developed a number of interactive software applications (such as *FoilSim*) that allow students to experiment with aircraft design. Visit ***http://www.grc.nasa.gov/WWW/K-12/aerosim/*** to find some excellent educational resources. There are also listings for many history resources (such as the poster about the Wright brothers and their 1903 Flyer) in the Resources section (p. 17 of this Guide).

III. Current Status Reports

The Centennial of Flight Commission reports on the expeditions and activities of the 100th Anniversary of Flight. There are calendars (see Resources section) which will aid students in discovering what is happening in their city or state. Articles in the newspapers and magazines as well as watching news reports may aid in student understanding of history and science of flight.

IV. Historical Research

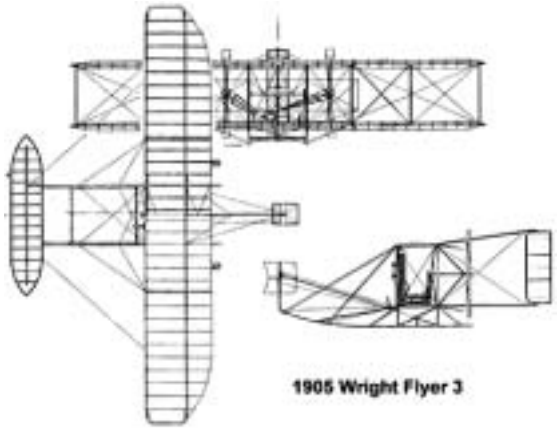
So, why *did* the Wright brothers' very brief (12-second) first flight make international news in 1903? The Centennial of Flight is more meaningful when students understand the history, the stories, and the personalities involved. Other inventors had succeeded in becoming airborne before the Wright brothers. What led to the Wrights' successful effort to design, build, and fly the first power-driven, heavier-than-air machine? What is the history of cooperation and competition between nations in the race to develop flying machines? A geography lesson on identifying these nations would aid the students in understanding world interest in the first controlled, powered flight, on the eve of World War One.

V. Interview Parents or Neighbors

Parents, grandparents, and/or neighbors may have interesting insights into how flight has changed during their lifetime. The students may wish to interview people of many ages to get their point of view about early, present, and future aircraft after viewing the Centennial of Flight web site (see Resources section).

VI. The Big Ideas

Students should focus their news report on one big idea. It is important not to try to answer too many questions in the short presentation. Focus on one big idea and respond to it as fully as possible. Sufficient time should be allowed to analyze the vast amount of information they discover. Class discussions regarding their data will help to organize this information in some way, for example, a web, or concept map. Once they have organized their concepts and information, students will be ready to discuss how to present the most important aspects of what they have learned.



1905 Wright Flyer 3

News Story Sample

A Fast Flight to Japan

Imagine flying from New York to Japan in two hours, or being a passenger on an aircraft cruising at an altitude of over 100 km. Aeronautic engineers have begun to define this vision, and build prototypes. Your students will likely fly on aircraft that emerge from this process.

I. A Local Connection

In this example, imagine that a business in your community is involved in a NASA project. For example, the business might be designing the computerized flight deck, enabling the pilots to monitor the complex array of flight status sensors and control the operation of the aircraft. Perhaps the mother of one of your students is an electrical engineer for this corporation. A local connection often serves as an effective entry point into a news report.

II. A Visitor and a Field Trip

Building on this connection, your students might invite someone from the business (such as the mother who is an electrical engineer) to visit the school to share information about the hypersonic aircraft in general and the flight deck in particular. It helps to have more than one visit as your students develop deeper understandings of the project, which in turn lead to new questions for the visitor. Then conduct one (or more) field trips to the corporation to see the research process in operation.

III. Macro View and Micro View

In conducting the research and preparing the news report, your students should keep two perspectives in mind. At the top level, your students convey the nature, purpose and overall design of the aircraft. At the detailed level, your students can use the computerized flight deck (with its local connection) as an illustrative example of what it takes to design, build, and test the aircraft.

IV. Extended Research

Your students can get further information on this project from several sources. They might contact a NASA center involved in designing, building or testing the hypersonic aircraft. Use NASA's web site to search for information on this project, and the NASA Image Exchange web site to get support graphics and animations. And your students might find articles published in the popular press.

V. Why and Why Not?

Your students should research pro and con views. Some people think this is an important and inevitable development in transportation technology with a range of benefits. Others feel that our busy lives are already fast enough; this new technology is not necessary; or hypersonic transport may have a detrimental environmental impact. Your students might research articles published on this project, or interview people in the community.

VI. Producing and Broadcasting a Video

Your students might decide to use a video format for the news report. If so, they might want to include interviews, scenes from the field trip, and pictures of the aircraft design and flight deck. The video should include discussion of a "big idea," such as the future of high-speed travel or the emerging role of computerized flight decks. If your students excel in the video, a local TV station might even want to broadcast it as a special news report!

Resources

These resources are updated periodically. Check the Science & Technology Journalism web site at ***http://www.nsip.net/competitions/journalism/index.cfm*** for the best and most up-to-date version.

U.S. Centennial of Flight Commission

This is the starting point for resources.
http://www.centennialofflight.gov

NASA Educational Materials

NASA Spacelink
http://spacelink.nasa.gov

Wind Tunnels of NASA
http://www.hq. nasa.gov/office/pao/History/SP-440/contents.htm

NASA History Website
http://www.hq.nasa.gov/office/pao/History/

NASA Glenn Research Center aeronautics resources (*FoilSim*)
http://www.grc.nasa.gov/WWW/K-12/aerosim/

NASA Centennial of Flight Posters
http://www.centennialofflight.gov/education/posters.htm

Smithsonian Institution National Air and Space Museum

The original 1903 Wright Flyer hangs in the Milestones of Flight Gallery of the Museum. NASM has produced many wonderful resources.

http://www.nasm.si.edu/galleries/gal100/wright1903.html

The original 1903 Wright Flyer drawing, photo, and explanatory poster:

http://www.nasm.si.edu/nasm/arch/wrights.html

NASA Press Releases

Subscribe by sending an email message to ***domo@hq.nasa.gov***. In the body of the message (not the subject line), type the words "subscribe press-release" (no quotes). Most NASA missions provide detailed Press Releases through the mission's web site. Find the sites through

http://www.nasa.gov

NASA Educational Programs

NASA Home Page
http://www.nasa.gov

NASA CORE
http://spacelink.nasa.gov/CORE

NASA's Educator Resource Centers
http://education.nasa.gov/ercn

NASA TV

NASA TV shows live broadcasts, press briefings, and video files for NASA missions. NASA TV is available by satellite and on the web. For details:

http://www.nasa.gov/ntv

NASA International Space Station Resources

ISS Assembly and Other Educator Guides

http://spacelink.nasa.gov/Instructional.Materials/NASA.Educational.Products/.index.html

Daily status reports

http://spaceflight.nasa.gov/spacenews/reports/issreports/2001

Video "Meet me at the Space Station"

http://spacelink.nasa.gov/Instructional.Materials/NASA.Educational.Products/Meet.Me.at.the.Station-Overview

View the ISS from your City:

http://www.scipoc.msfc.nasa.gov

Online News

ScienceWeek
http://scienceweek.com/

ABC News: Science
http://www.abcnews.com/sections/scitech/

BBC News: Science and Technology
http://news.bbc.co.uk/2/hi/science/nature/

CNN Sci-Tech
http://www.cnn.com/TECH/index.html

Earth and Sky
http://www.earthsky.com/

NASA Science News
http://science.nasa.gov/

NOVA Science in the News
http://www.science.org.au/nova/

Science Quest
http://quest.nasa.gov/about/

Radio Broadcasts

Talk of the Nation: Science Friday
A weekly live radio program on National Public Radio.

Sounds Like Science
A weekly science show from NPR News, every Saturday.

Air and Space Magazines

Air and Space Magazine
Science News
Astronomy
Sky and Telescope

Science and Journalism Books

Reporter's Environmental Handbook
by Bernadette West
ISBN 0-8135-2149-1

Field Guide for Science Writers
by Deborah Blum
ISBN 0-1951-2494-4

Additional Reading

P primary ***I*** middle school
E elementary ***A*** advanced 9–12+

Girls Think of Everything: Stories of Ingenious Inventions by Women. Catherine Thimmesh. Illustrated by Melissa Sweet. Houghton Mifflin. 64 pp. Trade ISBN 0-395-93744-2. (I) Women have changed our lives with their inventions from windshield wipers to bullet-proof vests. Thimmesh show us their inspirations and path to innovation. We learn how the inventors overcame obstacles and used creative thinking to

solve problems. Resources, Index, List of Women Inventors.

Exploring Caves: Journeys into the Earth. Nancy Holler Aulenbach and Hazel A. Barton with Marfé Ferguson Delano. Illustrated with photographs. National Geographic Society. 64 pp. Trade ISBN 0-7922-7721-X. (E, I) Visit the spectacular world of caves with a teacher and a microbiologist who are part of a National Geographic team creating an IMAX movie. Join these amazing women and share the science they investigate inside this subterranean world, as well as the experiences that led them to science and caving. Glossary, Index, Resources.

The Big Dig: Reshaping an American City. Peter Vanderwarker. Illustrated with photographs. Little, Brown. 56 pp. Trade ISBN 0-316-60598-0. (E, I) This is a fascinating chronicle of the building of Boston's underground expressway, the largest and most complex construction project any U. S. city has ever undertaken. The book describes a people's vision, determination, and cooperation. The colorful photographs, illustrations, and maps emphasize the many stages of this mammoth construction project. Glossary.

Jacques Cousteau (A&E Biography series). Lesley A. DuTemple. Illustrated with photographs. Lerner Publications. 112 pp. Library ISBN 0-8225-4979-4. (A) This biography shares the amazing journey of Jacques Cousteau from a small, weak boy to a pioneering underwater filmmaker. Readers learn how Cousteau led the crew of *Calypso* to develop new diving and filming technologies to share scientific research that opened a previously unknown undersea world. Timeline, Bibliography, Index.

The Reader's Digest Children's Atlas of the Universe. Robert Burnham. Illustrated by Wildlife Art Ltd. Reader's Digest Children's Books. 128 pp. Trade ISBN 1-57584-373-0, Library ISBN 1-57584-379-X. (I, A) Beautiful illustrations and a strong layout create an eye-catching, informative reference. This atlas visits the planets in our solar system as well as asteroids, comets, and meteors before proceeding to the stars and galaxies of deep space. Suggested activities for the reader encourage hands-on exploration of the concepts presented. Glossary, Index, Universe Fact File (includes facts on our solar system and other celestial objects, astrological and technological events, timeline of astronomy, and universal records).

The International Space Station (Let's Read and Find Out Science Book series). Franklyn M. Branley. Illustrated by True Kelley. HarperCollins. 36 pp. Trade ISBN 0-06-028702-0; Library ISBN 0-06-028703-9, Paperback ISBN 0-06-445209-3, Harper Trophy. (P, I) Got questions? This book has the answers—hundreds of them. It guides you through the construction of the Space Station to the virtual feeling of living 400 km (250 miles) above the Earth. Well designed, informative diagrams inspire readers to think beyond the box. Forward by Scott Carpenter, Experiment, Poster.